Ocean Exploration Advisory Board
A Federal Advisory Committee Act Committee

April 27, 2016

Assistant Secretary for Conservation and Management
Assistant Secretary for Observation and Prediction
Chief Scientist
National Oceanic and Atmospheric Administration
1401 Constitution Avenue, NW
Washington, DC 20330

Subject: FY19 Strategic Guidance Memoranda recommendations

Dear Admiral Brown, Dr. Blackburn, and Dr. Spinrad:

The Ocean Exploration Advisory Board (OEAB) has been asked to advise NOAA leadership on new paradigms for ocean exploration. The points below begin to address that tasking. But under any paradigm, exploring important areas and processes in the U.S. EEZ and global ocean require adequate resources. Previous national studies envision annual funding of $75 million to execute ocean exploration activities.

At the January 2016 meeting of the OEAB, we heard from the NOAA Chief Scientist about the importance of NOAA's Strategic Guidance Memoranda (SGM) process. In separate correspondence, the OEAB provided recommendations that are aligned with the already approved and promulgated FY18 SGMs. In this letter the OEAB provides recommendations for consideration in crafting your FY19 SGMs:

- America's future depends on an understanding of the global ocean. We, Americans, explore the ocean because its health and resilience are vital to our economy and our lives. Beginning in FY19, NOAA should play a more proactive role in interagency coordination for ocean exploration. As a start, the Office of Ocean Exploration and Research (OER) should designate at least 20% of its core budget for exploration campaigns, in a NOPP-like program, that involves participation by other federal agencies:
  - Navy (ONR and NAVOCEANO)
  - DOI (BOEM and USGS)
  - NASA
  - NSF
  - DOE
  - DHHS (NIEHS)
  - EPA
  - Gulf Restoration Council
- Increase the proportion of NOAA's ocean exploration funding that is assigned to campaigns carried out by scientists at U.S. academic institutions. NOAA should lead and provide core sustained funding for ocean exploration and support a national program by leading national requirements/opportunities workshops. Further, in

the spirit of cooperative partnerships, the wider U.S. oceanography community should increasingly carry out the actual campaigns. Such an emphasis should be part of an evolution toward an increasingly pivotal role for NOAA in partnering activities.

- A national ocean exploration program requires both federal and private funding. The best way to draw such sectors together is to build on models that can appeal to both public and private priorities. One small NOAA Cooperative Institute (CIOERT) is already successful. The Cooperative Institute model should be expanded to include a second competitively determined Cooperative Institute that would be responsible for ocean exploration campaign planning/execution and the widest distribution of exploration results.

    - Another institutional option is to consider proposing that a Congressionally chartered public-private institution be established to execute the national ocean exploration program. Models are the U.S. Institute of Peace and National Fish and Wildlife Federation, wherein federal funds are appropriated -- core funds from NOAA in this case -- private funds are raised, and a public-private board is established. The ambition of this endeavor would be to augment the annual budget for a national program for ocean exploration closer to the $75 million (annually, for ocean exploration activities) originally called for in the President's Panel on Ocean Exploration report.

- The largely unexplored global ocean requires international cooperation beyond national Exclusive Economic Zones; otherwise adequate coverage is not possible. NOAA OER should consider international ocean exploration projects and partnerships.

- Finish the at-sea ECS campaign. This will help satisfy longstanding Arctic priorities and generally put the U.S. in the best position possible should it get the opportunity to negotiate ECS claims.

- Establish a process to gather and prioritize exploration opportunities from the U.S. science community in concert with line office requirements from NOAA (and other federal agencies).

- Geographic Areas (in priority order):
    - Arctic
    - U.S. EEZ (Atlantic Coast, Gulf of Mexico, Pacific Coast, Alaska, Central/Western Pacific)
    - Open ocean areas that have a U.S. strategic interest

- Develop a community-based means to prioritize and fund the development of new exploration sensors and the adoption of innovative combinations of off-the-shelf technologies/instruments/vehicles for ocean exploration campaigns. New observational techniques and technologies have long been top strategic priorities for NOAA as a whole. Ocean exploration can play a leadership role, helping to stimulate such innovation.

- Special emphasis should be put on optimizing costly at-sea time by making water column and seafloor measurements and collecting samples whenever bathymetric and/or telepresence operations occur.

- Special emphasis should be put on planning to conduct ocean exploration campaigns that are less dependent on less mobile "mother ships."

- FY19 Strategic Guidance should further articulate NOAA's role in Science, Technology, Engineering, and Mathematics (STEM) and general public education. Such guidance should consider the positive role ocean exploration plays in enhancing ocean educational material, projecting NOAA's image, and inspiring public interest in the ocean. Clear articulation of NOAA priorities in these areas will help determine how much emphasis should be placed on telepresence and other live or publicly packaged results from ocean exploration expeditions.

  - Today, telepresence-based exploration is enabled primarily on two dedicated exploration vessels. The future of those aging vessels is an important resource question and is related directly to the priority NOAA puts on telepresence video results. Extending telepresence technologies to other, and more, vessels is likely to be an affordable option to expand national ocean exploration opportunities, noting that NASA and NSF increasingly value its application in their studies. But, NOAA should articulate the strategic importance it places on this particular exploration enabler.

  - There are likely to be fewer opportunities in the future for ocean explorers and scientists to go to sea due to costs and a lessened availability of ships. The OEAB has found that telepresence links to scientists ashore helps those scientists both understand the challenges of at-sea oceanography/exploration and participate in or lead such exploration events.

  - Further, telepresence empowers many ocean scientists because such links connect those who cannot readily deploy to sea (due to family, health, disability, or other restrictions) with live sea-going campaigns. An extra benefit is that telepresence can reach a national under-represented minority audience so important for the ocean sciences.

- There are many unknowns in the ocean. Some of those are captured with real-time video, others by bathymetric measurements in classic exploration campaigns. But, there are other unknowns that relate to understanding the ocean's behavior, health, and bounty. Some examples include:

  - Today we know too little about the spatial and temporal variability of the ocean's acidity.

  - After decades, World Wars, and the Cold War, we still know very little about the behavior of sound in the ocean and its relationship to marine life and to American commercial/defense/scientific operations.

- When one images and measures the shape of the seafloor, essential and complementary geophysical measurements (e.g., magnetics and gravity) are not normally made at the same time.

- The vast majority of the unexplored ocean "terrain" is the water column itself – the largest contiguous habitat for life on this planet.

There are exploration opportunities in addressing all of these (and more) sample unknowns.

- Certain unmeasured phenomena inevitably will become important over time and require routine observations or comprehensive survey. The OEAB recommends that the OER director be assigned the lead in investigating and characterizing newly important ocean phenomena, before routine observations or surveys are designed.

Sincerely,

Paul G. Gaffney II
Vice Admiral, U.S. Navy (Ret.)
Chair

Copy to: Assistant Secretary, Conservation and Management
Assistant Secretary, Observation and Prediction
Chief Scientist
Director, Ocean Exploration and Research
OEAB File